Claims

1. A method for the precise dynamic digital control of especially piezoelectric actuators for micropositioning systems, comprising a PID regulator, whereby

5    in order to minimise position order deviations the future system behaviour is estimated and current correction signals are obtained for the purpose of a feedforward correction,
characterised in that
for the reduction of latency times in the feedforward loop of the sampling

10   system, the signal of the command is applied via a switchable bypass to a first digital/analog converter of highest resolution, with this first digital/analog converter being operated at the sampling rate of the sampling system,
the PID feedforward loop further leads to a second fast digital/analog con-

15   verter which is controlled independent of the sampling system, and
the output signals of the first and second converter, which represent control voltages, are supplied in an added-up form to the device to be controlled, in particular, to a piezoelectric actuator which together with a position sensor forms the controlled system.

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2. The method in accordance with Claim 1,
characterised in that
a weighting and/or filtering of the signals of the command variable, which are supplied to the first digital/analog converter is carried out.

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3. The method in accordance with Claim 1,
characterised in that
the same command variable is applied to both the first fast digital/analog converter of the controlled system and the second high-resolution digi-

30   tal/analog converter of the controlled system.

4. The method in accordance with one of the previous claims,
characterised by
a linearisation of the controlled system for the purpose of avoiding system-

35   atic errors in the signal paths.

5. The method in accordance with one of the previous claims,
characterised by
a specific predistorion of the control voltages and/or the arrangement of
5   band elimination filters for the purpose of reducing system resonances.


6. The method in accordance with one of the previous claims,
characterised in that
the piezoelectric actuator is primarily operated in a controlled manner via the
10  command variable, the feedforward loop, and the first fast digital/analog
converter, while secondarily the controlled system with position sensor is
operated in a subordinate manner in order to avoid static errors.


7. The method in accordance with one of the previous claims,
15  characterised in that
changes of the command variable may be provided both to the first fast digi-
tal/analog converter, the second high-precision converter, or to both con-
verters via switch means and/or control commands.


20  8. The method in accordance with one of the previous claims,
characterised in that
various command variables may be fetched selectively via a further switch
means.